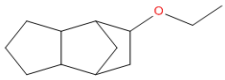
New Chemical Substance Data and Assessment Summary

CAS Name	4,7-Methano-1H-indene, 5-ethoxyoctahydro-,(3aR,4R,5S,7R,7aR)-rel-
CAS Number	1897392-68-5
Molecular Formula	$C_{12}H_{20}O$
Molecular Weight	180.29
SMILES	CCOC1CC2CC1C3CCCC23
Structure	

Physical Chemical Properties

Physical State at room temperature	liquid
Solubility in Water	0.0459 g/L at 20 °C and pH 6.7, flask method (submitter data)
Melting Temperature	17°C (EPISuite 4.11)
Vapor Pressure	0.147 mmHg at 25 °C (EPISuite 4.11)
Boiling Temperature	226 °C (EPISuite 4.11)
FlashPoint	90 °C (submitter data)
Relative Density	<1 g/cm3 (submitter data)
Henry's Law Constant	0.0000756 (EPISuite 4.11)
Octanol/Water Partition Coefficient	4.02 (submitter data)

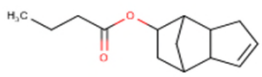
Persistance

Biodegradation	Not readily biodegradable (submitter data, EPI Suite 4.11)
Expert Survey Result - Ultimate Biodeg Model	2.8 (weeks) (EPI Suite 4.11)
Expert Survey Result - Primary Biodeg Model	3.6 (days-weeks) (EPI Suite 4.11)
Atm. Oxidation half life	0.39 days; 4.63 hrs (EPI Suite 4.11)
Hydrolysis half life	not estimated for this structure (EPI Suite 4.11)
Fugacity Level III Persistance time	443 hrs (EPI Suite 4.11)
Volatilization Half Life for Model River	11.77 hrs (EPI Suite 4.11)
Volatilization Half Life for Model Lake	241 hrs (EPI Suite 4.11)
Total STP Removal	33.15% (EPI Suite 4.11)

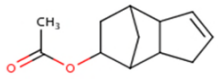
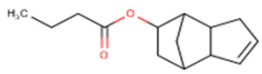
Bioaccumulation

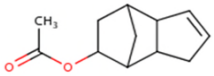
BCF factor	209 (EPISuite 4.11 BCFBAF)

Human Health Toxicity

Acute Oral and Dermal Toxicity Read across substance Butanoic acid, 3a,4,5,6,7,7a-hexahydro-4,7-methano-1H-indenyl ester CASRN 113889-23-9 	LD50 (oral) > 2,000 mg/kg bw (ECHA registration dossier for CAS 113889-23-9. Accessed 11/5/2018) LD50 (dermal) > 2,000 mg/kg bw (ECHA registration dossier CAS 113889-23-9. Accessed 11/5/2018)
Acute Inhalation Toxicity (Dusts and Mists)	No data available

Eye Irritation	Not an eye irritant (submitter data)
Skin Irritation	Skin irritant; not corrosive (submitter data)
Skin Sensitization	Not a skin sensitiser (submitter data)

Repeated Dose Toxicity Read across substance 4,7-Methano-1H-indenol, 3a,4,5,6,7,7a-hexahydro-, acetate CASRN 54830-99-8 	Read across substance 4,7-Methano-1H-indenol, 3a,4,5,6,7,7a-hexahydro-, acetate CASRN 54830-99-8 has been tested in an OECD 408 study in rats at dietary concentrations of 200, 2000, 6000 and 20000 ppm (equivalent to a mean achieved dosage of 15.3, 154.9, 464.1 and 1504.6 mg/kg bw/day respectively). The following endpoints were measured: clinical signs, body weights, ophthalmoscopic examination and neuronal behavior, food consumption, hematology, biochemistry, urinalysis, estrus cycle, thyroid hormone analysis, sperm analysis, gross pathology, organ weights, and histopathology. Reduced body weight was observed in the highest dose group, correlated with reduced food consumption and adverse effects on food efficiency (palatability). At the highest dose level, reduced chloride concentration, sodium concentration, aspartate aminotransferase levels, alanine aminotransferase levels, bile acid levels, and increased cholesterol levels were observed in male animals. The observed changes in aminotransferases, bile acid and cholesterol can be explained by the reduced food consumption. Changes in chloride and sodium concentrations may be explained by the observed kidney effects in males. Increased kidney weights were also observed in males, as well as hyaline droplet nephropathy, which is a rat-specific effect that is not relevant for humans. In females, no toxicologically significant effects were observed in clinical chemistry, organ weights or histopathology. The NOAEL could be established as the highest dose tested, 20000 ppm or 1500 mg/kg bw/day, under the conditions of this study. (ECHA registration dossier for CAS 113889-23-9; CAS 54830-99-8 used as read across substance for this endpoint. Accessed 11/5/2018. Additional reference: RIFM, 2012)
Repeated Dose Toxicity Read across substance Butanoic acid, 3a,4,5,6,7,7a-hexahydro-4,7-methano-1H-indenyl ester CASRN 113889-23-9 	Read across substance Butanoic acid, 3a,4,5,6,7,7a-hexahydro-4,7-methano-1H-indenyl ester CASRN 113889-23-9 has been tested in an OECD 407 28-day subchronic study in Sprague Dawley Crl:CD (SD) IGS BR strain rats. Groups of 5 rats/sex/group were administered test substance at doses of 15, 150 and 1,000 mg/kg in Arachis oil BP by oral gavage. The following endpoints were measured: body weights, functional/behavioural toxicity, food consumption, hematology, biochemistry, urinanalysis, gross pathology, organ weights, and histopathology. Clinical signs of salivation were observed immediately after the administration of the test material among animals of the high-dose group. This finding was short-lived and regressed in the recovery group animals. It was considered to be due to the unpleasant taste or locally irritant formulation of the test material and not the systemic toxicity of the test material. There were higher incidences of globular accumulations of eosinophilic material in the tubular epithelium of the kidneys among males of the mid- and high-dose groups, with no significant kidney weight changes. These kidney changes in males were consistent with documented changes of alpha-2μ-globulin nephropathy, which is species-specific to male rats in response to treatment with some hydrocarbons. This effect is not considered relevant to human health. Furthermore, the condition was observed to have regressed after the 14-day treatment-free recovery period for high-dose males. Thus, the NOAEL was considered to be 1000 mg/kg/day, the highest dose tested. (ECHA registration dossier for CAS 113889-23-9. Accessed 11/5/2018. Additional reference: RIFM, 2002)
NOAEL (mg/kg bw/day) **Repeated Dose Toxicity** Based on read across to CASRN: 54830-99-8	**1,500**

Reproductive and Developmental Toxicity Read across substance 4,7-Methano-1H-indenol, 3a,4,5,6,7,7a-hexahydro-, acetate CASRN 54830-99-8 	OECD 421 Reproduction and Developmental Toxicity Screening Test was performed with read across substance 4,7-Methano-1H-indenol, 3a,4,5,6,7,7a-hexahydro-, acetate CASRN 54830-99-8. Groups of 10 Wistar Han:HsdRccHan:WIST strain rats/sex/dose were administered doses of 100, 300, and 1000 mg/kg in Arachis oil BP by oral gavage. There were no unscheduled deaths, no clinically observable signs of toxicity, no adverse effect on bodyweight change, food and water consumption, no effects on the mating of treated animals, no effects on the fertility, gestation lengths, litter size, sex ratio and viability, offspring growth and development, offspring clinical observations. At scheduled sacrifice, no signs of treatment related alteration were observed in terms of organ weights, gross necropsy and histopathology. The treatment of rats with test material resulted in no treatment related alterations up to the highest dose tested, thus the NOAEL was determined to be 1000 mg/kg/day the highest dose tested. (ECHA registration dossier for CAS 113889-23-9; CAS 54830-99-8 used as read across substance for this endpoint. Accessed 11/5/2018. Additional reference: RIFM, 2010)
NOAEL (mg/kg bw/day) DART Based on read across to CASRN: 54830-99-8	**1,000**

Genotoxicity	No substantial increase in revertant colony numbers of any of the five tester strains was observed in a bacterial reverse mutation assay according to OECD 471/GLP. Salmonella typhimurium strains TA98, TA100, TA1535, TA1537 and E. coli WP2 uvrA were tested up to 5,000 µg/plate with and without S9. Cytotoxic effects and precipitation occurred with and without S9 starting from 1000 µg/plate in experiment 1 and 2500 µg/plate in experiment 2. (submitter data) Neither a statistically significant nor a biologically relevant increase in the number of micronucleated cells was observed in an in vitro micronucleus test conducted according to OECD 487/GLP in human lymphocytes and testing concentrations up to 343 µg/mL without S9 mix and up to 115 µg/mL with S9 mix (limited by phase separation). (submitter data)

Acute Aquatic Toxicity

Fish Acute Toxicity	LC50 (96h) = 9.09 mg/L (submitter data)	
Fish Acute COC (ppb)	**1,818**	
Daphnia Acute Toxicity	LC50 (48h) = 1.90 mg/L (submitter data)	
Daphnia Acute COC	**380**	
Algae Acute Toxicity	EyC50 (72h) = 2.93 mg/L (submitter data)	
Algae Acute COC (ppb)	**732**	

Chronic Aquatic Toxicity

Fish Chronic Toxicity	ChV = 0.9 mg/L (ACR10)	
Fish Chronic COC (ppb)	**90**	
Daphnia Chronic Toxicity	ChV = 0.19 mg/L (ACR10)	
Daphnia Chronic COC	**19**	
Algae Chronic Toxicity	NOEyC <0.0252 mg/L	NOErC = 0.805 mg/L (submitter data)
Algae Chronic Toxicity	LOEyC ≤ 0.0252 mg/L	LOErC = 2.48 mg/L (submitter data)
Algae Chronic Toxicity	EyC10 < 0.0252 mg/L	ErC10 = 2.21 mg/L (submitter data)
Algae Chronic Toxicity	ChV = <0.0252 mg/L (Geometric mean of NOEyC (72h) and LOEyC; or EyC10, as values are the same)	
Algae Chronic COC (ppb)	**2.5**	

LOWEST COC (ppb) Based on chronic algae	**2.5**

Proc 1: Import and processing at site controlled by the submitter - Blending into a fragrance mixture

CAS No. 1897392-68-5		Submitter:	
INDUSTRIAL OPERATIONS INFORMATION:			
Operation Name		**Number of Sites**	1
Location		**Operating Days Per Year**	195

INDUSTRIAL RELEASE SUMMARY:

Release source	Daily Release (kg/site-day)	Release Days per Year	No. of Sites of Release	Total Release (kg/year -all sites)	Media, Release Site Information and Control Efficiency
Equipment cleaning multi-vessel {Release 3}	0.36	195	1	70.02	Water, POTW, NPDES #s:

OCCUPATIONAL EXPOSURE SUMMARY:

Route	Dose Rate	Days/yr	No. Workers	Cancer LADD	Chronic ADD	Acute APDR
Dermal	2,247	195	1	9.8 mg/kg-d	17.1 mg/kg-d	32.1 mg/kg-d
Inhalation	4.0	195	1	0.02 mg/kg-d	0.03 mg/kg-d	0.06 mg/kg-d
Total number of Workers – All Sites						1

GENERAL POPULATION EXPOSURE SUMMARY:

	Cancer LADDpot	Chronic ADDpot	Acute ADRpot
Drinking Water	4.34E-06 mg/kg-d	8.14E-05 mg/kg-d	1.96E-04 mg/kg-d
Fish Ingestion	6.54E-06 mg/kg-d	1.23E-04 mg/kg-d	1.08E-03 mg/kg-d
Fugitive Emissions			
Incineration Emissions			
Landfill Leaching			
Dermal – Consumer Use			
Inhalation – Consumer Use			

Proc 1: Import and processing at site controlled by the submitter - Blending into a fragrance mixture

CAS No. 1897392-68-5	Submitter:

INDUSTRIAL OPERATIONS INFORMATION:

Operation Name		Number of Sites	1
Location		Operating Days Per Year	195

AQUATIC RISK ASSESSMENT

Acute Profile	Endpoint	Effect Level (ppb)	Assessment Factor	Acute COC (ppb)	PEC (ppb)	Potential for Risk?
	Fish	9,090	5	1,818	8.38	Low
	Daphnid	1,900	5	380	8.38	Low
	Green Algae	2,930	4	732	8.38	Low

Chronic Profile	Endpoint	Effect Level (ppb)	Assessment Factor	Chronic COC (ppb)	PEC (ppb)	Days of Exceedance	Potential for Risk?
	Fish	909	10	90	8.38	0	Low
	Daphnid	190	10	19	8.38	0	Low
	Green Algae	25	10	2.5	8.38	20	Low

HUMAN HEALTH RISK ASSESSMENT

	Hazard Concern	NOAEL/ LOAEL (mg/kg-d)	Exposure Dose and Source (mg/kg-d)	MOE	Potential for Risk?
Occupational Risk	Systemic Effects	1,500 (NOAEL)	17.1 (combined inh and dermal Chronic ADD)	87	Yes
	DART	1,000 (NOAEL)	17.1 (combined inh and dermal Chronic ADD)	58	Yes
General Population Risk	Systemic Effects	1,500 (NOAEL)	2.04E-04 (combined DW and Fish Chronic ADDpot)	7.35E+06	Low
	DART	1,000 (NOAEL)	2.04E-04 (combined DW and Fish Chronic ADDpot)	4.9E+06	Low

AQUATIC RISK ASSESSMENT SUMMARY

Lowest Acute COC – Aquatic Exposure	380
Lowest Chronic COC – Aquatic Exposure	2.5
Predicted Environmental Concentration (PEC)	8.38
PEC Exceeds Chronic COC (days / year)	20

HEALTH RISK ASSESSMENT SUMMARY

MOE – Acute Occupational Exposure	NA – low hazard
MOE – Chronic Occupational Exposure	58 – driven by occupational dermal exposure w/o gloves
MOE – Acute General Population Exposure	NA – low hazard
MOE – Chronic General Population Exposure	4.9E+06 – low

Proc 2: Consumer Product Manufacturing

CAS No. 1897392-68-5	Submitter:

INDUSTRIAL OPERATIONS INFORMATION:

Operation Name	Proc 2 Consumer Product Manufacture	**Number of Sites**	15
Location	various	**Operating Days Per Year**	125

INDUSTRIAL RELEASE SUMMARY:

Release source	Daily Release (kg/site-day)	Release Days per Year	No. of Sites of Release	Total Release (kg/year -all sites)	Media, Release Site Information and Control Efficiency
Drum cleaning (acute scenario)	0.6245 +(0.019+0.013) =0.66	11	15	105	Water, SIC code for SD mfg
Equipment cleaning (chronic scenario)	0.019	125	15	35	Water, SIC code for SD mfg
Convey, mix, pack consumer products (chronic scenario)	0.013	125	15	23.63	Water, SIC code for SD mfg

OCCUPATIONAL EXPOSURE SUMMARY:

Route	Dose Rate	Days/yr	No. Workers	Cancer LADD	Chronic ADD	Acute APDR
Dermal	224.7	125	435	0.63 mg/kg-d	1.1 mg/kg-d	3.21 mg/kg-d
Inhalation	0.3	125	435	0.0008 mg/kg-d	0.0015 mg/kg-d	0.0043 mg/kg-d
Total number of Workers – All Sites						435

GENERAL POPULATION EXPOSURE SUMMARY:

	Cancer LADDpot (*)	Chronic ADDpot (*)	Acute ADRpot (*)
Drinking Water	2.30E-06 mg/kg-d	4.31E-05 mg/kg-d	1.05E-03 mg/kg-d
Fish Ingestion	3.46E-06 mg/kg-d	6.49E-05 mg/kg-d	1.01E-02 mg/kg-d
Fugitive Emissions			
Incineration Emissions			
Landfill Leaching			
Dermal – Consumer Use			
Inhalation – Consumer Use			

(*) taken from proc site with highest calculated dose from E-Fast

Proc 2: Consumer Product Manufacturing

CAS No. 1897392-68-5		Submitter:	
INDUSTRIAL OPERATIONS INFORMATION:			
Operation Name	Proc 2 Consumer Product Manufacture	**Number of Sites**	15
Location	various	**Operating Days Per Year**	125

AQUATIC RISK ASSESSMENT

Acute Profile	Endpoint	Effect Level (ppb)	Assessment Factor	Acute COC (ppb)	PEC (ppb)		Potential for Risk?
	Fish	9,090	5	1,818	63.14		Low
	Daphnid	1,900	5	380	63.14		Low
	Green Algae	2,930	4	732	63.14		Low
Chronic Profile	**Endpoint**	**Effect Level (ppb)**	**Assessment Factor**	**Chronic COC (ppb)**	**PEC (ppb)**	**Days of Exceedance**	**Potential for Risk?**
	Fish	909	10	90	3.08	0	Low
	Daphnid	190	10	19	3.08	0	Low
	Green Algae	25	10	2.5	3.08	16	Low

HUMAN HEALTH RISK ASSESSMENT

	Hazard Concern	NOAEL/ LOAEL (mg/kg-d)	Exposure Dose and Source (mg/kg-d)	MOE	Potential for Risk?
Occupational Risk	Systemic Effects	1,500 (NOAEL)	1.1 (combined inh and dermal Chronic ADD)	1,364	No
	DART	1,000 (NOAEL)	1.1 (combined inh and dermal Chronic ADD)	909	No
General Population Risk	Systemic Effects	1,500 (NOAEL)	1.08E-04 (combined DW and Fish Chronic ADDpot)	1.39E+07	Low
	DART	1,000 (NOAEL)	1.08E-04 (combined DW and Fish Chronic ADDpot)	9.26E+06	Low

AQUATIC RISK ASSESSMENT SUMMARY	
Lowest Acute COC – Aquatic Exposure	380
Lowest Chronic COC – Aquatic Exposure	2.5
Predicted Environmental Concentration (PEC)	63.14
PEC Exceeds Chronic COC (days / year)	11
HEALTH RISK ASSESSMENT SUMMARY	
MOE – Acute Occupational Exposure	NA – low hazard
MOE – Chronic Occupational Exposure	909
MOE – Acute General Population Exposure	NA – low hazard
MOE – Chronic General Population Exposure	9.26E+06 - Low

SUMMARY CONCLUSIONS:

Occupational Risk:

Risk of Non-Cancer Acute Effects from Occupational Exposure: Low potential for acute risk due to low hazard since dermal rat LD50 > 2,000 mg/kg based on read across data.

Risk of Non-Cancer Chronic Effects from Occupational Exposure: potential chronic risk has been identified for activities occurring at the submitter's site only, the derived MOE of 58 is <100, however the exposure estimate is driven by dermal exposure without any hand protection, which is overly conservative. Currently implemented standard industrial hygiene practices require workers to wear chemical resistant gloves and clothing covering body parts with exposed skin. The already required Personal Protective measures will mitigate the dermal exposure and lower the chronic risk.

Risk of Cancer Effects from Occupational Exposure: not evaluated

General Population Risk:

Risk of Non-Cancer Acute Effects to General Population: Low potential for acute risk due to low hazard since oral rat LD50 > 2,000 mg/kg based on read across data.

Risk of Non-Cancer Chronic Effects to General Population: Low potential for chronic risk due to derived MOE >1,000.

Risk of Cancer Effects to General Population: not evaluated

Aquatic Risk:

Acute Risk to the Aquatic Environment:

The PEC values (Predicted Environmental Concentration) for all processing scenario 1 (8.38 ppb) and 2 (63.14 ppb) are **below** the derived acute COC (Concentration of Concern) values.

Chronic Risk to the Aquatic Environment:

PEC values (Predicted Environmental Concentration) for processing scenario 1 (8.38 ppb) and 2 (3.08 ppb) are both **above** the derived chronic COC (Concentration of Concern) values. However, the risk is low because all exceedances are less than the 21 day concern window.

Environmental Exposure

Environmental exposure may result from surface water releases from Processes 1 and 2.
The releases and Predicted Environmental Concentration (PEC) have been estimated using ChemSTEER and E-FAST. The derived PEC values for Processes 1 and 2 are summarized below and details per each processing step can be found in tables on pages 5 and 7.

PROC 1 PEC = 8.38 ppb
PROC 2 acute PEC = 63.14 ppb
PROC 2 chronic PEC = 3.08 ppb

Occupational Exposure

Occupational Exposures have been estimated using ChemSTEER. The calculated exposure dose details per each processing step can be found in tables on pages 4 and 6.

General Population Exposure

General Population Exposures have been estimated using ChemSTEER. The calculated exposure dose details per each processing step can be found in tables on pages 4 and 6.

References

RIFM (Research Institute for Fragrance Materials, Inc.), (2002). Twenty-eight day repeated dose oral (gavage) toxicity study in the rat of butanoic acid, 3a,4,5,6,7,7a-hexahydro-4,7-methano-1H-indenyl ester. Unpublished report from International Flavors and Fragrances. Report number 47783 (RIFM, Woodcliff Lake, NJ, USA).

RIFM (Research Institute for Fragrance Materials, Inc.), (2010). Acetoxydihydrodicyclopentadiene (Mixture of Isomers) (cyclacet): Oral (gavage) reproduction/developmental toxicity screening test in the rat. Unpublished report from International Flavors and Fragrances. Report number 59511 (RIFM, Woodcliff Lake, NJ, USA).

RIFM (Research Institute for Fragrance Materials, Inc.), (2012). Acetoxydihydrodicyclopentadiene (Mixture of Isomers): Ninety day repeated dose oral (dietary) toxicity study in the rat. Unpublished report from International Flavors and Fragrances. Report number 64051 (RIFM, Woodcliff Lake, NJ, USA).